

## NOTE ON THE DEVELOPMENT OF THE VERSURIDÆ.

### PLATE V.

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Although the early stages of development, the Gastrula and Scyphistoma of some of those Rhizostomæ which possess a single Sub-genital space, the Monodenmia of Haeckel, are known of one or two species; the later stages, the Ephyra and the Metamorphosis of these Medusæ is unknown. Only Haeckel observed young stages of a Medusa belonging to the Crambessidæ, but these also had attained a size of from 30 to 40 mm., and appeared similar to the adult animal. (1.)

I have had the luck to capture some very young stages of the Phyllorhiza punctata, a new species described in another paper (2), which is very abundant in Port Jackson. The smallest of these measured 15 mm. across the disk, and I obtained an unlimited number of specimens from this size upward to the adult animal, which measures half a meter across the Umbrella. In colour and shape these small larvæ are similar to the adult animals.

Claus (1) has described the development of the Mouth-arms in Rhizostoma Cuvieri (Pilema pulmo. Haeckel), which belongs to the Family Torenmidæ. In our species the Mouth-arms follow in their development a similar course as that described by Claus.

The Sub-genital space appears to be formed in the way that Haeckel supposes, but I am as yet not quite sure on this point.

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(1.) Since this paper was read I received "*Untersuchungen über die Organisation und Entwicklung der Medusen.*" By C. Claus, in which paper the Metamorphosis of Catylorhiza tuberculata is described (page 43, f. f.) The characteristic peculiarity in the Metamorphosis of Phyllorhiza punctata—the decrease of the number of marginal bodies does not occur in Catylorhiza. The cause of the brown colour in the latter is ascribed by Claus to Zooxanthellæ in a similar manner as by myself in Phyllorhiza.

(2.) Proc. Lin. Soc. N.S.W., Vol., IX., p. 296.

The number of marginal bodies or organs of sense (Sinneskolben) is in the Discomedusæ nearly always eight, only very few possess more, none less. The number hardly ever exceeds 32. The development of the forms with more than eight marginal bodies is unknown. Haeckel (1) supposes that in these cases already the *Scyphystoma* possesses a greater number of tentacles.

Our *Phyllorhiza*, in its adult state possesses eight marginal bodies, between every two of which there are two ocular flaps, four simple and four double marginal flaps (plate V., fig. 4.)

I have never observed any variation in the number of the marginal bodies of the adult animal except when the margin had been injured, in which case, marginal bodies are produced irregularly in the regenerated and irregular part of the margin. The young stages (plate V., figs. 1-3) possess a greater number of marginal bodies. It is not likely that *Phyllorhiza punctata* will differ in this respect from all the other members of the Family, and so we may assume it as not unlikely, that the development described below for *Phyllorhiza punctata* is met with in many of the other Versuridæ.

The youngest stage which I have observed, measuring 15 mm. (fig. 1) possesses 24 marginal bodies. In the radii of the first, second, and fourth order. The margin of the Umbrella bears in each Octant between two ocular flaps, four broad and low flaps which are to be considered as two flaps only, each possesses an indenture in the middle, the accessory marginal bodies are situated in these indentures.

These sense-organs are slightly smaller than the persisting eight, but do not differ from them in shape. Larvæ measuring 30 mm. across the Umbrella show these marginal bodies in a few Octants only, whilst in the others there is situated only one sense-organ in the Radii of the *third* order. It is evident that the larvæ lose these marginal bodies of the quaternary Radii at the time of their attaining this size. They are slowly replaced by others, one always taking the place of two. A form is in that way attained,

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(1.) *E. Haeckel*. Das System der Medusen. Seite 458.

which possesses eight accessory marginal bodies besides the eight persistent ones. (Fig. 2.) The flaps of the Umbrella margin adjacent to these adradial marginal bodies grow out to greater length and commence to divide into two flaps by fission.

Larvæ, with a diameter of 50 mm., lose these adradial bodies also (fig 3), and by a continued fission of the marginal flaps the configuration of the Umbrella margin of the adult animal is attained.

Such a formation of marginal bodies has, to my knowledge, not been observed before, and tends to prove the great fundamental difference between these *Scyphomedusæ* which have more marginal bodies in the young than in the adult state, and *Hydromedusæ*, which often possess fewer sense-organs, when young, than when grown up.

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#### EXPLANATION OF PLATE.

Plate V.—Part of the Umbrella margin of *Phyllorhiza punctata*, all enlarged so as to be of the same size.

Fig. 1. Larva with 15 mm. diameter.

Fig. 2. Larva with 30 mm. diameter.

Fig. 3. Larva with 50 mm. diameter.

Fig. 4. Adult with 250 mm. diameter.